

Appendix K

North Bend Gravel Operation Aesthetics Technical Report

NORTH BEND GRAVEL OPERATION

AESTHETICS

TECHNICAL REPORT

For

KING COUNTY

Prepared by
Huckell/Weinman Associates, Inc.
Huitt-Zollars, Inc.

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1.0 INTRODUCTION

Cadman, Inc. is proposing to mine and process sand and gravel resources on two sites east of the City of North Bend. Operations at the sites would include mining, conveying, and processing of sand and gravel. Processing would include the production of aggregate products, asphalt and concrete.

This aesthetics report illustrates (through photographs) and describes the existing aesthetic character of the sites and surrounding area. Primary viewer groups are identified and representative viewpoints selected. The proposed phased clearing and mining are described, and representations of the visual conditions of various mining phases from representative view locations are provided. The visual impacts of the proposed processing facilities are analyzed. Emphasis is placed on potential impacts to views of mining activities; views of processing facilities from surrounding roads (i.e., I-90), residential areas, and key scenic and recreational areas; and views prior to the establishment of buffers and vegetative screening. Existing light and glare conditions are analyzed, and potential light and glare impacts are identified.

The alternatives analyzed in this report include the following:

- Alternative 1 – No Action.
- Alternative 2 – Proposal; Lower and Upper Sites Mining-Exit 34 .
- Alternative 2A – Upper Site Mining and Limited Lower Site Mining-Exit 34
- Alternative 3 – Lower and Upper Sites Mining (Exits 34 and 38)
- Alternative 3A – Upper Site Mining and Limited Lower Site Mining-Exits 34 and 38
- Alternative 4 – Upper Site Mining-Exit 38

2.0 METHODOLOGY

View representation methodology includes identifying viewpoints from which the sites are visible, based on comments received during the public scoping process and professional judgment. Photographs of the existing topographic and vegetative features of the sites were taken; the various proposed project features are illustrated within individual photographs, where feasible, to visually demonstrate how a particular view is likely to change following implementation of the proposal or alternatives (data sources for the visual representations include USGS DEM data, King County GIS Coverages, and AutoCAD Drawings from Jones & Jones). For certain viewpoints, 3D models in 3D Studio of terrain illustrating proposed grading and structures is utilized. For some viewpoints, illustrations using Adobe Photoshop are made on the existing photos to simulate a change in the view, without any modeling.

View analysis of the proposed North Bend Gravel Operation encompasses a high number of variables including:

- Viewer sensitivity or receptiveness to changes in the view
- Numbers of viewers
- Viewer distance from operations
- Viewer elevation
- Appearance of operations when viewed (contrast with surroundings)
- Visual contrast between the operations and surroundings.

Considering all possible factors from all possible viewpoints would produce an analysis too complex meet the intent of SEPA to be easily understandable, and usable by the public and by decision-makers. For the North Bend Gravel Operation, a simplified system was used to provide a general ranking of impacts. This analysis considers visual resources only and does not consider noise, dust, and glare impacts covered in other sections. The analysis also assumes that views of gravel operations would be considered an impact on views by most observers. Two main factors are considered most important in rating impacts for this project:

1. Visibility - Operations may be fully visible, screened by topography or screened by vegetation. Operations, which are not screened from view, will have a stronger affect on the view.
2. Distance between the observer and operations - Unscreened views from points close to the operations may be noticeably affected because the operations occupy a large portion of the view and detail of operations is perceptible. Unscreened views from distant points may be less strongly affected because only color and form are discernable and the operations occupy a small portion of the view.

The evaluation criteria were applied to the main project element, (upper site, lower site, or conveyor system) which would have the greatest effect on observers in the area under consideration.

The major visual characteristics of each project element that affect views are explained briefly below:

- Upper site: Located on top of a ridge. Views from above may look into the site operations. Views from below will largely be unaffected except for changes to views of the ridgeline vegetation and ridgeline elevation.
- Lower site: Located in a valley at the base of a ridge. Views from above may look into the site operations. Some views from elevations near or below the site will be blocked by topography.
- Conveyor system: Located on a hillside but not on a ridge. Views from the side would largely be screened by vegetation, views "in line" with the conveyor alignment will be most affected.

Specific description of criteria is provided in the following table. The level of anticipated impact is described as high, medium, low and zero. High impact occurs when the operations are close to the observer, occupy a large portion of the view or are not screened. Medium impact consists of views where some view of the mining activity would be visible, but the existing character of the view is not anticipated to change. Low impact would afford only a glimpse of the mining activity. Zero impact occurs when the operations are not visible. The following table describes how intermediate conditions are evaluated.

Visibility of Operation	Distance between Observer and Project Element		
	Close (0-1/2 mile)	Middleground (1/2-5 miles)	Distant (Over 5 miles)
Fully visible.	High Impact Viewpoint is higher than the trees, which surround the rim of the excavation. The operations will occupy a large portion of the view.	High to Medium Impact Viewpoint is higher than the trees, which surround the rim of the excavation. The operations will occupy a moderate portion of the view. The visual contrast between operations and surrounding forested areas is high.	Medium to Low Impact Viewpoint is higher than the trees, which surround the rim of the excavation. The operations will occupy a small portion of the view. The visual contrast between operations and surrounding forested areas is high.
Screened by evergreen vegetation.	Medium to Low Impact Views of operations are screened by evergreen trees and understory. The high visual contrast between the operations and surroundings may make them partially visible.	Low to Zero Impact Views of operations are screened by evergreen trees and understory. The high visual contrast between the operations and surroundings may have a slight effect on visibility.	Zero Impact Views of operations are screened by evergreen trees and understory. The effect of high visual contrast between the operations and surroundings is reduced by distance.
Screened by topography.	Zero Impact The operations cannot be seen because topography blocks the view.	Zero Impact The operations cannot be seen because topography blocks the view.	Zero Impact The operations cannot be seen because topography blocks the view.

3.0 EXISTING CONDITIONS

3.1 AESTHETICS

3.1.1 Existing Visual Character

3.1.1.1 Area Context

The aesthetic character of the Upper Snoqualmie Valley is typified by river floodplains, upland plateaus, and the foothills of the Cascade Mountains. Mount Si, Mount Washington, Mailbox Peak, and Rattlesnake Ridge rise dramatically from the river lowlands and visually define the Upper Snoqualmie Valley as the gateway between the Cascade Mountains and the Puget Sound lowlands.

Historically, the aesthetic character of the built environment of the Upper Snoqualmie Valley was typically forest and small town in nature, with a more recent trend toward suburban-style development. The rivers, and forested hillsides and mountains of the area, are also used extensively for recreation.

3.1.1.2 Sites

Overall, the visual character of the sites is of forested areas, with some bare ground on the Lower Site. The Lower Site is at the base of Grouse Ridge, at approximately elevation 690, and contains a former gravel mining operation. The Upper Site is at the top of Grouse Ridge, at approximately elevation 1,600. Both sites, and the adjacent area to the east, are used for forest production. Most of the forested area on the sites has been logged and is in various stages of new tree growth.

3.1.2 Primary Viewer Groups and Selected Viewpoints

The primary viewer groups in the area of the sites include the following: motorists using I-90 as the freeway approaches and passes adjacent to the sites; motorists using area roadways, including North Bend Way; residents in the immediate site vicinity, including those along SE 144th Street, SE Middle Fork Road, SE Lake Dorothy Road, and SE 153rd Street; the Lu residence (Viewpoints 10, 11 and 12); and residents farther from the sites, including those residing in the Uplands residential development. Another potential viewer group includes recreational users at viewpoints on the numerous trails in the vicinity. The greatest number of people viewing the sites are anticipated to be from I-90 and Mount Si.

Photographs were taken from locations representative of the primary viewer groups and locations where views could be most affected by proposed mining and processing. Figure 1, Visualization Viewpoints, illustrates the viewpoint locations. Representative Viewpoints are illustrated in Figures 1a through 14a.

3.1.3 Views to the Site

A representative view of the sites from near the summit of Mount Si, in the Mount Si Natural Resources Conservation Area, is illustrated in Figure 1a. As illustrated in this figure, a panoramic view of the Upper Snoqualmie Valley is afforded from this viewpoint. Prominent features of this view include residential and commercial development in the valley floor, I-90, Grouse Ridge, and several peaks of the Cascade Mountains. From this viewpoint, both the top and sides of Grouse Ridge are clearly visible, and the patchwork of clear-cut and forest plantation areas indicative of forest management is evident. The existing surface mine area on the Lower Site is also visible, but is not visually prominent. Approximately 72,000 people visited Mount Si in the year 2000 (refer to the Recreation Technical Report for detail).

Figure 2a illustrates the view from the Uplands subdivision on the northeastern slope of Rattlesnake Ridge. From this vantage point, a forested hillside is prominent in the foreground, with the western slope of Grouse Ridge and Mailbox Peak visible in the background. Views of the top of Grouse Ridge or the Lower Site are not afforded.

A representative view from residences along SE Middle Fork Road and SE Lake Dorothy Road is illustrated by Figure 3a. From this viewpoint, a view of the northern slope of Grouse Ridge, filtered by deciduous vegetation, is afforded (the top of Grouse Ridge is not visible from this viewpoint). Mount Washington is prominent in the background.

FIGURE 1 VISUALIZATION VIEWPOINTS

FIGURE 1a MT. SI - EXISTING CONDITION

FIGURE 2a THE UPLANDS - EXISTING CONDITION

FIGURE 3a MIDDLE FORK ROAD - EXISTING CONDITION

FIGURE 4a HAHN RESIDENCE - EXISTING CONDITION

FIGURE 5a NORTH BEND WAY - EXISTING CONDITION

FIGURE 6a I-90 EASTBOUND - EXISTING CONDITION

FIGURE 7a 53RD/143RD PL. SE - EXISTING CONDITION

FIGURE 8a 1-90 WESTBOUND - EXISTING CONDITION

FIGURE 9a IRON HORSE TRAIL - EXISTING CONDITION

FIGURE 10a LU RESIDENCE 1 - EXISTING CONDITION

FIGURE 11a LU RESIDENCE 2 - EXISTING CONDITION

FIGURE 12a LU RESIDENCE 3 - EXISTING CONDITION

FIGURE 13a UPPER I-90 - EXISTING CONDITION

FIGURE 14a IRON HORSE TRAIL 2 - EXISTING CONDITION

A typical view from the homes north of the Lower Site, across SE 144th Street, is illustrated in a view from the second floor of the Hahn residence Figure 4a. The overall character of the existing views from this residence is of forested valley and hillsides. From the Hahn residence, filtered views of the vegetated portion of the Lower Site and the western slope of Grouse Ridge are available. Partial views of Mount Washington and I-90 are visible in the background.

Figure 5a illustrates a typical view from eastbound on North Bend Way. From this point on the roadway, views of the eastbound and westbound lanes of I-90, grass and forested areas between North Bend Way and I-90, and vegetation between the eastbound and westbound lanes of I-90 are prominent in the foreground. The west slope of Grouse Ridge is prominent in the background. A partial view of Mailbox Peak is also afforded. The overall character of this view is of roadways surrounded by forested area.

A typical view from eastbound I-90 is illustrated by Figure 6a. The overall character of this view is of roadway with forested hillside and mountain beyond. From this viewpoint, the I-90 roadway is prominent in the foreground with the western slope of Grouse Ridge prominent in the background. The upper portion of Mailbox Peak is also visible in the foreground. Approximately 26,000 vehicle trips per day use I-90 east of North Bend (figures specific to eastbound and westbound traffic was not available – refer to the Transportation Technical Report for detail).

Figure 7a illustrates a view from the intersection of 153rd Street/470th Place SE, which is intended to be representative of views from residences in this area. From this viewpoint, views of the roadway, improvements to residential lots (i.e., fences, rockeries etc.), and forest area are afforded in the foreground. Portions of the western slope of Grouse Ridge and Mailbox Peak are prominent in the background. The overall character of this view is of rural residential uses surrounded by forest, hillside and mountains.

A representative view from westbound I-90 is illustrated by Figure 8a. From this viewpoint, views of a portion of the previous mining area on the Lower Site, the Lu residence, and Mount Si are visible. Views to the majority of the Lower Site are obscured by deciduous vegetation along the northern edge of I-90. In general, this viewpoint affords a panoramic view of a portion of the Upper Snoqualmie Valley and Mount Si. This section of westbound I-90 acts as a visual gateway between the Cascade Mountains and the Puget Sound lowlands. Approximately 26,000 vehicle trips per day use I-90 east of North Bend (figures specific to eastbound and westbound traffic was not available – refer to the Transportation Technical Report for detail).

Figure 9a illustrates a view from the section of the Iron Horse Trail traversing the northern slope of Mount Washington. From this viewpoint, Mount Si and a small portion of the Upper Snoqualmie Valley are visible. No views of the Lower Site or Grouse Ridge are afforded from this viewpoint. Approximately 200,000 people visited the Iron Horse Trail in the year 2000 (refer to the Recreation Technical Report for detail).

Figures 10a and 11a illustrate two representative views from the Lu residence. The second floor of the main residence building (Figure 10a) affords views of the Lu residence grounds, vegetated portions of the Lower Site, portions of the western slope of Grouse Ridge, a quick glimpse of I-90, and Mount Washington. Figure 11a illustrates the view from the grounds of the Lu residence. From this viewpoint, views of the

western slope of Grouse Ridge, vegetated portions of the Lower Site, a portion of I-90, and Mount Washington are afforded. The overall character of views from the Lu residence to the south is of forested valley, hillsides, and mountains.

A representative view from the Lu residence (Viewpoint 12) is illustrated by Figure 12a. The meditation hut is located approximately 1,000 feet east of the Lu residence. From this vantage point, forested area, the existing mining area on the Lower Site, and I-90 are visible in the foreground. Mount Washington and Rattlesnake Ridge are visible in the background. No view of the Upper Site is afforded from this viewpoint.

From I-90, south and east of the Upper Site (Viewpoint 13a), the overall character of this view is of roadway with the forested southern ridge of Grouse Ridge beyond. A portion of the Homestead Valley mine is also visible.

From the Iron Horse Trail (Viewpoint 14a), south and east of the Upper Site, the forested southern slope of Grouse Ridge and the Homestead Valley mine dominate the view. A distant view of Mount Si is also afforded.

3.2 LIGHT AND GLARE

3.2.1 Existing Lighting Conditions

The lighting conditions in the area vary considerably, with I-90 and the auto oriented commercial area along 468th Avenue SE containing a relatively high level of lighting and the areas north and east of the commercial area (including the sites) containing a relatively low light level.

Lighting sources on I-90 include pole-mounted lighting at Exits 32 and 34, pole-mounted lighting along I-90 approximately 0.25 mile east of both exits, two electronic reader signs, and motorist headlights. Vehicle headlights on I-90 are visible at long distances from higher elevation areas. Lighting sources associated with the auto-oriented commercial area include pole-mounted street lighting on 468th Avenue SE, illuminated business signs, building lighting, and numerous pole-mounted parking lot lights (the parking-lot lighting does not include cutoffs to direct light to the parking lot area and limit lighting to surrounding areas; sign lighting consists of unshielded lights directed up into the atmosphere). The level of lighting at this commercial area is relatively high and is the major light source in the area. Other sources of light in the area west of 468th Avenue SE include business lighting along North Bend Way and street lighting along limited portions of SE 140th Street.

The area east of 468th Avenue SE, including the Lower and Upper Sites, is rural in character with limited sources of light. The primary sources of light in the area include courtyard lighting at the Lu residence (globe lights approximately 8 feet high), security lighting associated with an outdoor storage business on SE Middle Fork Road (just east of 468th Avenue SE), dispersed residential yard and house lighting, and yard lighting at the Vallley Camp. Light associated with the Washington State Patrol Fire Training Academy is not readily visible from lower-elevation areas in the site vicinity.

To provide a general quantification of existing lighting levels in the area, light levels were measured on May 7, 2001 utilizing a Hagner Model EC1 light meter. The measurements were taken at ground level at various distances from the light source. For example, street lighting along Middle Fork Road measured 0.8 foot-

candle directly under the street light and decreased to 0.0 as the meter moved away from the source (street lighting measures 0.0 at a distance of approximately 3 to 4 times street light height). Light sources that are located closer to ground level tend to measure a higher light level than sources located further from ground level. Light levels are measured in terms of foot-candles – foot-candles are defined as “a unit of illumination, equivalent to the illumination produced by a source of one candle at a distance of one foot.” The results of the light level measurements are provided below.

Auto Truck Plaza:	Parking Lot	0.2 to 5.0 Foot-Candle Range
	Fuel Pump Dispensing	30 Foot-Candles
76 Station: (S.E. 164 th St.)	Parking Lot	2.0 to 5.0 Foot-Candle Range
	Fuel Pump Dispensing	90 Foot-Candles
S.E. 164 th St.	Street lighting	0.0 to 1.2 Foot-Candle Range
Middle Fork Rd.	Street lighting	0.0 to 0.8 Foot-Candle Range
I-90 Ramp	Street lighting	0.0 to 1.0 Foot-Candle Range

The Lower and Upper Sites are undeveloped and contain no sources of light. The limited light sources in the vicinity of the sites results in outstanding views of the nighttime sky on clear nights.

3.2.2 Existing Glare Conditions

The sites are currently undeveloped with no sources of glare. Limited glare in the area is currently generated by buildings associated with the commercial area along 468th Avenue SE, residential structures, and automobiles using I-90 and other area roadways.

4.0 ENVIRONMENTAL IMPACTS

4.1 CONSTRUCTION IMPACTS

4.1.1 Alternative 1 – No Action

Under the No Action Alternative, no construction activity would occur on the sites. Harvesting of trees on the site would occur in the future. Compared to the Proposal, visual impacts from harvesting would be similar to those anticipated from clearing of land prior to the commencement of mining.

4.1.2 Alternative 2 – Proposal; Lower and Upper Sites Mining-Exit 34

Phased clearing of portions of the Lower and Upper Sites would result in “clear-cut” like areas on the sites. The cleared areas would be visible, but not as visually prominent as exposed mining areas. Clearing and grading of the conveyor alignment also would result in a cut area on the west side of Grouse Ridge. Subsequent to the completion of mining on the Lower Site, the asphalt, concrete, and aggregate processing facilities would be constructed on the site. Construction itself would not generate significant visual impacts.

It is possible that additional sources of light would be used on the Lower Site during construction of the processing facilities, which could increase lighting levels in the area on a short-term basis.

4.1.2.1 Alternative 2A – Upper Site Mining and Limited Lower Site Mining-Exit 34

Impacts would be the same as Alternative 2.

4.1.3 Alternative 3 – Lower and Upper Sites Mining (Exits 34 38)

Under this alternative, visual conditions during phased clearing of the Lower and Upper Sites would be similar to conditions under the Proposal. However, clearing and grading of the conveyor alignment would not occur. Construction of the aggregate processing facility on the Upper Site could require lighting.

4.1.3.1 Alternative 3A – Upper Site Mining and Limited Lower Site Mining-Exits 34 and 38

Impacts would be the same as Alternative 3.

4.1.4 Alternative 4 – Upper Site Mining-Exit 38

Under this alternative, no construction impacts would occur on the Lower Site. Construction impacts on the Upper Site would be similar to those under the Proposal, although clearing and grading of the conveyor alignment would not occur. Overall, construction impacts would be less than under the Proposal.

4.2 OPERATION IMPACTS

4.2.1 Alternative 1 – No Action

Under the No Action Alternative, visual conditions of the sites would not change from existing conditions and would generally remain as illustrated in Figures 1a through 12a. As forest harvesting on the sites begins in the future, clear-cut conditions on portions of the Lower and Upper Sites would be visible from portions of the surrounding area. Light and glare conditions on the sites would not change. Conversion of the sites to another allowed land use could change the visual conditions of the sites.

4.2.2 Alternative 2 – Proposal; Lower and Upper Sites Mining-Exit 34

4.2.2.1 Aesthetics

Development of the Proposal would temporarily convert approximately 260 acres of the 578-acre Upper Site and approximately 40 acres of the 115-acre Lower Site from existing forest-production land to sand and gravel mining and processing use. Proposed mining activity would result in the removal of existing trees and exposure of sand and gravel resources within the proposed mining areas. The Lower Site would also include the establishment of approximately 50-foot high surge piles and approximately 50-foot high concrete and asphalt processing facilities. A conveyor alignment between the Lower and Upper Sites would be established.

Some visual simulations of the conveyor portray the conveyor in a red color in order to clearly depict its location. Cadman, Inc. however, describes the conveyor as being covered with a non-reflective metal cap to blend in with the tree canopy. These simulations offer a worst-case scenario analysis.

4.2.2.2 Views to the Sites

Depending on the viewpoint, all, a portion of, or none of the proposed mining and processing areas would be visible. Representative views to the sites, illustrating visual conditions with proposed mining, are shown in Figures 1b through 14h. As explained under Existing Conditions, views depicting the sites were chosen to represent primary viewer groups.

Figure 1b illustrates the computer model alignment for the visual representation for this viewpoint. The view from near the summit of Mount Si during Phases 1, 6 and 10 are illustrated in Figures 1c, 1d and 1e, respectively. As illustrated in Figures 1c, 1d and 1e, proposed mining areas, cleared area for the conveyor alignment (including conveyor, water pipeline and maintenance road), and a portion of the maintenance road outside of the conveyor alignment would be clearly visible from the summit of Mount Si, with the extent of mined area increasing as mining progresses. During Phase 1 (Figure 1c), the mining excavation area, freshwater pond and surge pile on the Lower Site, and the conveyor alignment between the Lower and Upper Sites, would be visible. The floor and side walls of the Lower Site mining area and the conveyor alignment would be exposed and highly visible. By Phase 6 (Figure 1d), additional surge piles and the concrete plant would be visible on the Lower Site, as would the exposed floor of the Upper Site mining area. However, by Phase 6 vegetation would likely have become established on the side walls of the Lower Site mining area and on the edges of the conveyor alignment, lessening the visual prominence of that portion of the mining activity. Mining on the western portion of the Upper Site would be visible by Phase 6, with a portion of the pit floor most visually prominent. At Phase 10 (Figure 1e), visual conditions at the Lower Site would be similar to those during Phase 6. The extent of observable mined area on the Upper Site would be substantial during Phase 10. However, with the proposed phased reclamation, the total amount of exposed mine area would be similar to the amount exposed during Phase 6. The level of visual impact from this viewpoint to the Upper and Lower Sites would be considered high.

Figures 2b and 2c illustrate the computer model alignment of the visual representative for the Uplands viewpoint. Figures 2d and 2e illustrate the view of the proposed mining areas from the Uplands subdivision. From this viewpoint, no view of mining areas on the Upper or Lower Sites would be available. A distant view of the cleared area associated with the conveyor alignment traversing the western face of Grouse Ridge would be visible. As indicated in Figure 2e, mining areas on both sites would be hidden by existing topography. The level of visual impact from this viewpoint would be considered low.

A representative view of mining activity from residences along SE Middle Fork Road and SE Lake Dorothy Road is illustrated by Figures 3b, 3c and 3d. As illustrated in Figure 3b, by Phase 6, a slight lowering of the northern rim of Grouse Ridge would be visible. Figure 3c depicts the view after mining under Phase 10 is complete. As illustrated in Figure 3c, some additional lowering of the northern rim of Grouse Ridge would be visible, resulting in a slight increase in the amount of Mount Washington visible in the background. The level of visual impact from this viewpoint would be considered medium.

FIGURE 1b MT. SI - MODEL ALIGNMENT

FIGURE 1c MT. SI PHASE I

FIGURE 1d MT. SI - PHASE 6

FIGURE 1e MT. SI - PHASE 10

FIGURE 2b THE UPLANDS - MODEL ALIGNMENT

FIGURE 2c THE UPLANDS - MODEL ALIGNMENT/FOREGROUND LAYER

FIGURE 2d THE UPLANDS - PHASE 10

FIGURE 2e THE UPLANDS - UNSEEN AREAS

FIGURE 3b MIDDLE FORK ROAD - PHASE 6

FIGURE 3c MIDDLE FORK ROAD - PHASE 10

FIGURE 3d MIDDLE FORK ROAD - UNSEEN AREAS

Figures 4b, 4c and 4d illustrate the view of the proposed mining areas from the second floor of the Hahn Residence (representative of view from homes to the north of the Lower Site, across SE 144th Street). Views to the Lower Site mining area would be limited to a glimpse of the southern side wall and a small portion of the conveyor alignment (Figure 4b). With the establishment of vegetation on the side walls, views to mining on the Lower Site would be lessened although the view of a portion of the conveyor alignment would remain (Figure 4c). As shown in Figure 4d, the majority of the Lower Site mining area would be hidden by existing vegetation, and all of the Upper Site mining area would be hidden by existing topography. Considering the screening provided by existing topography and vegetation, the level of visual impact from this viewpoint would be considered low.

A typical view of proposed mining areas from North Bend Way is illustrated in Figures 5b and 5c. From this viewpoint, the Lower Site mining area would be hidden by existing vegetation, and the Upper Site mining area would be hidden by existing topography. The cleared area for the conveyor alignment, the conveyor, and a portion of the maintenance road outside of the conveyor alignment would be visible. The level of visual impact from this viewpoint would be considered medium.

Figures 6b and 6c illustrate the view from eastbound I-90. As shown in Figures 6b and 6c, the proposed mining area on the Lower Site would be hidden by existing topography. The cleared area associated with the conveyor alignment, the conveyor, and a portion of the maintenance road outside of the conveyor alignment traversing the western face of Grouse Ridge would be visible. The level of visual impact from this viewpoint would be considered medium.

Views to the sites from Camp Waskowitz are represented by viewpoints 5 and 6, from North Bend Way and I-90 respectively. As indicated by these viewpoints illustrations, views to mining activities on the Upper and Lower Sites would be blocked by existing topography. The only project feature visible from this viewpoint would be a portion of the conveyor alignment traversing the western face of Grouse Ridge. Viewpoint 16 was added to this Final EIS to illustrate worst-case view conditions with the conveyor.

Figures 7b and 7c illustrate the view from the intersection of 153rd Street/470th Place SE, which is intended to be representative of views from the residences in this area. As shown in Figure 7c, only small portions of the mining areas on the Lower and Upper Sites would be within the angle of view from this location, and proposed mining activity on both sites would be hidden by existing topography. A portion of the clearing associated with the conveyor alignment and the conveyor would be visible. The level of visual impact from this viewpoint would be considered medium.

A representative view from westbound I-90 is illustrated by Figures 8b, 8c and 8d. As illustrated by Figure 8b, the majority of the Lower Site mining area is hidden by existing vegetation along the north side of I-90. A glimpse of the northern side wall would be afforded from this viewpoint (Figure 8b). As illustrated by Figure 8c, with establishment of vegetation on the side wall by Phase 6, the slight view of the mining area would be softened. The level of visual impact from this viewpoint would be considered low.

FIGURE 4b HAHN RESIDENCE - PHASE 1

FIGURE 4c HAHN RESIDENCE - PHASE 6

FIGURE 4d HAHN RESIDENCE - UNSEEN AREAS

FIGURE 5b NORTH BEND WAY - PHASE 1

FIGURE 5c NORTH BEND WAY - UNSEEN AREAS

FIGURE 6b I-90 EASTBOUND - PHASE 1

FIGURE 6c I-90 EASTBOUND - UNSEEN AREAS

FIGURE 7b 153RD ST./143RD PL. SE - PHASE 1

FIGURE 7c 153RD ST./143RD PL. SE - UNSEEN AREAS

FIGURE 8b I-90 WESTBOUND - PHASE 1

FIGURE 8c I-90 WESTBOUND - PHASE 6

FIGURE 8d I-90 WESTBOUND - UNSEEN AREAS

Figure 9b illustrates the view of the proposed mining areas from Iron Horse Trail. From this viewpoint, no view of mining activity on either the Upper or Lower Sites is available. As indicated in Figure 9b, the mining area on the Lower Site is hidden by existing vegetation, and the mining area on the Upper Site is outside the angle of view. The level of visual impact from this viewpoint would be considered zero.

Figures 10b, 10c, 10d, 11b and 11c illustrate the view of proposed mining areas from the Lu residence. As illustrated in Figures 10b, 10c, and 10d, from the second floor of the main residence, a portion of the southern side wall and a small portion of the conveyor alignment and conveyor would be visible. As indicated in Figure 10c, vegetation would soften the view of the southern side wall by Phase 6. Figure 11b and 11c illustrate that mining areas on both the Lower and Upper Sites would be completely hidden behind either existing topography or vegetation. The clearing associated with the conveyor alignment and the conveyor would be visible and would be prominent, although the character of the view would not be significantly changed. The level of visual impact from this viewpoint would be considered medium.

A representative view of proposed mining activity from the Lu residence (Viewpoint 12) is illustrated by Figures 12b, 12c, and 12d. At the end of Phase 1 (Figure 12b), the majority of the pit floor, freshwater pond, and southern side wall would be visible. By Phase 6, the processing plants and the surge pile would also be visible (Figures 12c and 12d). Also by Phase 6, vegetation would be established on the south side wall, minimizing the visual impact to a degree. (It should be noted that during winter, the view to the Lower Site would be greater than depicted due to loss of deciduous vegetation.) Overall, the view from the Lu residence (Viewpoint 12) would be significantly altered from the existing condition. The level of visual impact from this viewpoint would be considered high.

From westbound I-90, east of the Upper Site (Figures 13b and 13c), direct views to the Upper Site mining area would be screened by topography and vegetation. However, clearing of vegetation on the Upper Site by Phase 6 would result in a slight thinning and reduction in tree height along the southern edge of Grouse Ridge. No view of the Lower Site is afforded from this location. The level of visual impact from this viewpoint would be considered low.

From Iron Horse Trail, south and east of the Upper Site (Figures 14b and 14c), direct views of the Upper Site mining area would be screened by topography and vegetation. Clearing of vegetation on the Upper Site by Phase 6 would result in a thinning and reduction in tree height along the southern edge of Grouse Ridge. No view of the Lower Site is afforded from this location. The level of visual impact from this viewpoint is considered low.

4.2.2.3 Alternative 2A – Upper Site Mining and Limited Lower Site Mining-Exit 34

The view from near the summit of Mount Si during Phases 1, 6, and 10 of the Alternative 2 Lower Site Option is illustrated in Figures 1f, 1g, and 1h. The view from this location would be similar to that under Alternative 2; with the Lower Site mining area and conveyor alignment being the most visible elements. As under Alternative 2, the majority of proposed mining activities on the Lower Site would be visible from this location, although fewer surge piles would be visible. Visual conditions on the Upper Site would be the same as under Alternative 2. Overall, the level of visual impact from this viewpoint would be somewhat less than under Alternative 2, but would still be considered high.

FIGURE 9b IRON HORSE TRAIL - UNSEEN AREAS

FIGURE 10b LU RESIDENCE 1 - PHASE 1

FIGURE 10c LU RESIDENCE 1 - PHASE 6

FIGURE 10d LU RESIDENCE 1 - UNSEEN AREAS

FIGURE 11b LU RESIDENCE 2 - PHASE 1

FIGURE 11c LU RESIDENCE 2 - UNSEEN AREAS

FIGURE 12b LU RESIDENCE 3 - PHASE 1

FIGURE 12c LU RESIDENCE 3 - PHASE 6

FIGURE 12d LU RESIDENCE 3 - UNSEEN AREAS

FIGURE 13b UPPER I-90, PHASE 6

FIGURE 13c UPPER I-90 - UNSEEN AREAS

FIGURE 14b IRON HORSE TRAIL 2, PHASE 6

FIGURE 14c IRON HORSE TRAIL - UNSEEN AREAS

FIGURE 1f MT. SI – LOWER SITE OPTION, PHASE 1

FIGURE 1g MT. SI – LOWER SITE OPTION, PHASE 6

FIGURE 1h MT. SI – LOWER SITE OPTION, PHASE 10

From the second story of the Hahn residence, views to the Lower Site during Phase I would be limited to a glimpse of the southern side wall and portion of the conveyor alignment (Figure 4e), similar to Alternative 2. With establishment of vegetation on the side walls, views to mining areas on the Lower Site would be lessened (Figure 4f). As under Alternative 2, the level of visual impact from this viewpoint would be considered low.

From westbound I-90 (Figures 8e and 8f), the majority of the Lower Site would be hidden by existing vegetation along the north side of the interstate, similar to Alternative 2. A somewhat greater view of the northern side wall would be afforded than under Alternative 2. As under Alternative 2, the level of visual impact from this viewpoint would be considered low.

From the second story of the Lu residence, a smaller portion of the southern side wall and the section of the conveyor within the Lower Site mining area would be visible compared to Alternative 2 (Figures 10e and 10f). However, as under Alternative 2, the visual impact from this viewpoint under the Lower Site Option would be considered medium.

From the Lu residence (Viewpoint 12) (Figure 12e), the southern side wall would be clearly visible, similar to Alternative 2; although the amount of pit floor and freshwater pond area visible from this viewpoint would be less than under Alternative 2. By Phase 6 (Figure 12f), vegetation would be established on the south side wall, minimizing visual impacts, similar to Alternative 2. Although the amount of disturbed area visible would be less than under Alternative 2, the overall level of visual impact from the Lu residence (Viewpoint 12) would be considered high.

4.2.2.4 Light and Glare

LIGHT CONDITIONS

Proposed mining and processing facilities would result in new light sources on both the Upper and Lower Sites. The proposal would introduce lighting into an area that currently has very low light levels. The new fixed light sources anticipated for the Lower Site would include lighting on the concrete and asphalt plant buildings, lighting on the aggregate processing facility, lighting on conveyors within the mining area (lighting along the conveyor between the Upper and Lower Site is not proposed), and pole mounted security lighting.

To obtain light level measurements representative of conditions within the mining area of the Proposed Action, light levels at the existing Cadman Sky River facility in Monroe were measured on May 9, 2001. The measurements were taken at ground level at various distances from the light source. The lighting at the Monroe site was minimal as there is not a large quantity of luminaires installed at the site. The existing lighting provided general levels of illumination at the main building, stockpile operations and excavation site. The lighting levels provided are minimal and generally within the location that is being illuminated. The lighting equipment utilized consists of semi cutoff cobra head luminaires for parking/roadway illumination, building mounted wall packs for area lighting and floodlighting for the site operational lighting. All of the equipment utilized high pressure sodium lamps.

FIGURE 4e HAHN RESIDENCE – LOWER SITE OPTION, PHASE 1

FIGURE 4f HAHN RESIDENCE – LOWER SITE OPTION, PHASE 6

FIGURE 8e I-90 WESTBOUND – LOWER SITE OPTION, PHASE 1

FIGURE 8f I-90 WESTBOUND – LOWER SITE OPTION, PHASE 6

FIGURE 10e LU RESIDENCE 1 – LOWER SITE OPTION, PHASE 1

FIGURE 10f LU RESIDENCE 1 – LOWER SITE OPTION, PHASE 6

FIGURE 12e LU RESIDENCE 3 – LOWER SITE OPTION, PHASE 1

FIGURE 12f LU RESIDENCE 3 – LOWER SITE OPTION, PHASE 6

The results of the light level measurements are provided below.

Monroe Plant	Parking Lot	0.0 to 1.2 Foot-Candle Range
Monroe Plant	Building Area Lighting	0.4 to 7.0 Foot-Candle Range
Monroe Plant	Operations Area Lighting	0.5 to 15.0 Foot-Candle Range

A comparison of light levels anticipated within the Lower Site to existing levels in the vicinity of the sites indicates that light levels would be greater than the rural residential and forest areas and less than the commercial area along 468th Avenue SE. Parking lot light levels on the Lower Site would be less than those at the Auto Truck Plaza or 76 Station and would be similar to those associated with street lighting along Middle Fork Road and SE 164th Street. Light levels associated with building area lighting would be similar to the existing parking lot lighting at the Auto Truck Plaza and 76 Station. Light levels within the main operations area would be greater than the existing parking lots at the Auto Truck Plaza and 76 Station, and significantly less than those associated with the pump islands. As mentioned previously, the lighting levels indicated are those adjacent to the source. Intervening topography and implementation of lighting techniques to minimize light glare would minimize light levels to area properties.

Direct impacts related to new lighting would be minimized by locating all light sources below the top of the mining rim and by directing light down on to the area to be lit, not in a sideways manner that can result in light directly reaching off-site properties. It is also proposed that all lighting utilize “low pressure sodium” bulbs; a type of lighting that emits a low-intensity light designed to minimize impacts to surrounding properties and nighttime sky viewing, and “full cutoff luminaries” to direct light on-to the mining areas, not up or beyond the sites. Additional recommendations to provide further reduction in lighting include: locating concrete and asphalt plant building lighting high on the structure and utilization of forward throw optics to direct light away from the building; and, independently mounting mining area lighting (i.e. not directly attached to equipment) to allow for a more downward throw of light.

Because no processing facilities would be located on the Upper Site, the number of fixed lighting sources would be less than anticipated for the Lower Site and would primarily be located on conveyors and loaders within the mining area. As for the Lower Site, proposed fixed lighting sources on the Upper Site would utilize “low pressure sodium” bulbs and “full cutoff luminaries” to minimize impacts of lighting on off-site areas. In addition, proposed lighting sources would be located below the top of the mining area rim, further limiting the potential for lighting to reach adjacent properties. The additional lighting recommendations for the Lower Site would also be applicable for the Upper Site.

Mobile sources of light from vehicular equipment would increase on both sites. Because the mobile sources of light would primarily be located at the floor of the mining areas, light from mobile sources would be anticipated to be contained within the mining areas. Light associated with off-site truck trips would increase, particularly during the winter months when there are more hours of darkness. The increased light from trucks would be primarily limited to SE 146th Street and 468th Avenue SE from SE 146th Street to I-90.

With the proposed features to limit light spillage to off-site properties, significant impacts to adjacent properties from fixed and mobile sources of light on the sites would not be anticipated. Because of the existing overall low level of light, establishment of new lighting sources in the area would produce an indirect “glow” of light that would be visible from surrounding areas. The characteristics of the indirect “glow” of light would be anticipated to vary somewhat depending on atmospheric conditions. For example, during periods of low cloud cover and fog, the indirect “glow” of light would reflect-off of cloud cover and would be more visible than during clear nights. However, because nighttime sky viewing is conducted on clear nights, sensitivity to indirect “glow” by certain viewers could be higher during clear atmospheric conditions.

GLARE CONDITIONS

The Proposal would introduce new facilities that would increase the potential for glare, including increased vehicular traffic on area roadways, establishment of fixed processing facilities, introduction of mobile equipment within mining areas, and establishment of the conveyor between the Lower and Upper Sites. Because the processing facilities and mobile equipment would be below the top of the mining area rim, significant impacts from these facilities would not be anticipated. The proposed conveyor between the Lower and Upper Sites would be approximately 4 feet above the ground and would be enclosed in a low-reflective material. By enclosing the conveyor, the conveyor can be located close to existing trees, further limiting glare potential. Glare from truck traffic using area roadways and I-90 would increase the overall amount of glare on these roadways. However, because truck traffic from the Proposal would be a small percentage of the overall traffic on these roadways, a significant increase in glare would not be anticipated.

4.2.2.5 Dust and Steam

Proposed mining and processing activities on the Upper and Lower Sites would generate dust and steam that could be visible from adjacent and distant viewpoints. Dust would be generated on the both the Upper and Lower Sites by excavation, sorting and stockpiling sand and gravel, and by truck and equipment movement on unpaved surfaces. Steam would be generated on the Lower Site as a byproduct of asphalt production. The level of dust and steam visibility would depend on weather and wind conditions; for example, the potential for visible dust would be greater during dry weather. Steam from the asphalt plant would likely be more visible during times of calm winds when there would less steam dispersion. The presence of a steam plume could present an industrial character to the view.

4.2.3 Alternative 3 – Lower and Upper Sites Mining (Exits 34 38)

Under this alternative, visual conditions during early phases of the mining operation (i.e., prior to establishment of the processing facilities) would be identical to those under the Proposal. Upon completion of the mining of sand and gravel resources at the Lower Site, aggregate processing facilities would be located at the Upper Site and, as under the Proposal, asphalt and concrete processing facilities would be established at the Lower Site. As under the Proposal, approximately 260 acres of the Upper Site and 40 acres of the Lower Site would be cleared of existing vegetation, mined in a phased manner, and would be visible from some locations. New lighting could be required on the roadway from Exit 38; the new light could be visible from the south. Compared to the Proposal, relocation of the aggregate processing facility to the Upper Site would not significantly change the view to the Lower and Upper Sites from most areas.

The Mount Si and Lu residence viewpoints would change the most from conditions under the Proposal. As illustrated by Figures 1i, 1j and 1k, the view of the aggregate processing facility from Mount Si would be shifted from the Lower Site to the Upper Site and the conveyor would not be established. In addition, the aggregate facility would be located in the far eastern corner of the mining area on the Upper Site, thus moving the aggregate processing facility farther from this viewpoint than under the Proposal. As under Alternative 2, the level of visual impact from this viewpoint would be considered high.

From the Lu residence, the surge pile and small portion of the conveyor alignment that would be visible under the Proposal would not be established (Figure 10g). However, the level of visual impact from this viewpoint would still be considered medium. Similarly, from the Lu residence (Viewpoint 12) (Figure 12g), the surge pile and processing facilities that would be visible under the Proposal would not be established. However, because of the extent of visible mining area, the level of visual impact from this viewpoint would still be considered high.

Relocation of the aggregate processing facility to the Upper Site would increase the amount of lighting on the Upper Site and reduce lighting on the Lower Site. As under the Proposal, lighting would utilize low pressure sodium bulbs and full cutoff luminaries to minimize lighting impacts on adjacent properties. Lighting impacts on the nighttime sky would be similar to the Proposal. Light from trucks utilizing SE Grouse Ridge Road to Exit 38 would be greater than under the Proposal.

From the Iron Horse Trail 2 (Figure 14d), the view of the Upper Site would be similar to that under Alternative 2. However, by Phase 6 the level of thinning and reduction in the tree height along the southern edge of Grouse Ridge would be less than under Alternative 2. As under Alternative 2, the level of visual impact from this viewpoint would be low.

4.2.3.1 Alternative 3A – Upper Site Mining and Limited Lower Site Mining-Exits 34 and 38

The view to the Lower Site from Mount Si under the Alternative 3 Lower Site Option is illustrated in Figures 1l, 1m and 1n. Views from this area would be similar to those under Alternative 3; however, the area of visibly cleared ground would be reduced and some undisturbed ground between the mining area and the freshwater pond would remain. Overall, the level of visual impact from this viewpoint would be somewhat less than under Alternative 3 but would still be considered high.

From the second story of the Hahn residence, views to the Lower Site during Phase I would be limited to a glimpse of the southern side wall (Figure 4g) similar to Alternative 3. With establishment of vegetation on the side walls, views to mining areas on the Lower Site would be lessened (Figure 4h). As under Alternative 3, the level of visual impact from this viewpoint would be considered low.

The view to the Lower Site from the Lu residence (Viewpoint 12) during Phase 6 is illustrated in Figure 12h. From this viewpoint, the processing facility would be slightly less than under Alternative 3. However, because of the extent of visible mined area, the level of visual impact from this viewpoint would still be considered high.

FIGURE 1i MT. SI – ALTERNATIVE 3, PHASE 1

FIGURE 1j MT. SI – ALTERNATIVE 3, PHASE 6

FIGURE 1k MT. SI – ALTERNATIVE 3, PHASE 10

FIGURE 10g LU RESIDENCE – ALTERNATIVE 3, PHASE 1

FIGURE 12g LU RESIDENCE 3 – ALTERNATIVE 3, PHASE 6

FIGURE 14d IRON HORSE TRAIL 2 – ALTERNATIVE 3, PHASE 6

FIGURE 11 MT. SI ALTERNATIVE 3 – LOWER SITE OPTION, PHASE 1

FIGURE 1m MT. SI – ALTERNATIVE 3 – LOWER SITE OPTION, PHASE 6

FIGURE 1n MT. SI – ALTERNATIVE 3 – LOWER SITE OPTION, PHASE 10

FIGURE 4g HAHN RESIDENCE – LOWER SITE OPTION – ALTERNATIVE 3, PHASE 1

FIGURE 4h HAHN RESIDENCE – LOWER SITE OPTION – ALTERNATIVE 3, PHASE 6

FIGURE 12h LU RESIDENCE 3 – LOWER SITE OPTION – ALTERNATIVE 3, PHASE 6

4.2.4 Alternative 4 – Upper Site Mining -Exit 38

Under this alternative, no clearing of existing vegetation, mining, or establishment of processing facilities would occur on the Lower Site and the Lower Site would remain in its existing forestry use. In the future, forest harvesting activities would occur on the site, which affect views from certain viewpoints. However, forest production activities on the Lower Site would occur over a significantly shorter period than mining/processing under the Proposal, and no processing facilities or surge piles would be established. Figures 1o and 1p illustrate the view of Alternative 4 from Mount Si. As illustrated by these figures, no change in visual conditions on the Lower Site would occur, and visual conditions on the Upper Site would be similar to Alternative 2. Although the overall visual impacts would be less than under the Proposal, the level of visual impact from this viewpoint would be considered high.

Elimination of mining on the Lower Site and elimination of processing facilities entirely would result in lower levels of light than under the Proposal. Impacts on the nighttime sky would be less than under the Proposal. Light from trucks utilizing SE Grouse Ridge Road to Exit 38 would be greater than under the Proposal.

5.0 ADDITIONAL VISUAL ANALYSIS

Subsequent to the issuance of the Draft EIS, additional visual analysis was conducted based on comments received on the Draft EIS. The additional analysis includes: existing and proposed views under Alternative 2 from three additional viewpoints; maps illustrating areas where views to proposed mining activities and facilities are afforded; cross-sectional representations from selected viewpoints; and, analysis of the screening effectiveness of vegetation at various stages of growth.

5.1 ADDITIONAL VIEWPOINTS

5.1.1 Existing Conditions

Figure 15a illustrates the view of the sites from near the summit of Mailbox Peak. From this vantage point, a panoramic view of the Snoqualmie Valley is afforded. The Fire Training Academy and the top of Grouse Ridge (Upper Site) are prominent in the foreground. Mt. Washington, I-90, the valley floor and Rattlesnake Ridge dominate the background. Approximately 3,500 people used the mailbox Peak trail head in the year 2000 (refer to the Recreation Technical Report for detail).

A representative view of the proposed conveyor alignment from SE 144th Street is illustrated in Figure 16a. From this viewpoint, the forested western slope of Grouse Ridge is prominent in the foreground, with Mailbox Peak visible in the background.

Figure 17a illustrates the view from the Snoqualmie Point Overlook. From this viewpoint, the grass amphitheater, stage and tree-line dominate the foreground. Mt. Si, Mailbox Peak and the Cascade Range are prominent in the background. I-90, the western slope of Grouse Ridge and the area of the Lower Site are also visible in the background. The City of North Bend does not maintain records of the use at this park.

FIGURE 1o MT. SI – ALTERNATIVE 4, PHASE 6

FIGURE 1p MT. SI – ALTERNATIVE 4, PHASE 10

FIGURE 15a EXISTING FROM MAILBOX PEAK

FIGURE 16a EXISTING CONVEYOR ALIGNMENT

FIGURE 17a EXISTING SNOQUALMIE POINT OVERLOOK

5.1.2 Environmental Impacts

The view from near the summit of mailbox Peak during Phases 1, 6 and 10 are illustrated in Figures 15b, 15c and 15d, respectively. As illustrated in Figure 15b, a portion of the proposed mining area and infiltration pond on the Lower Site would be visible in the background during Phase 1; because no mining activity on the Upper Site would occur during Phase 1, no aesthetic impacts on the Upper Site would occur. During Phase 6 (Figure 15c), mining activity on the western portion of the Upper Site and the upper portion of the conveyor alignment would be visible in the foreground and processing facilities on the Lower Site would be visible in the background. By Phase 6, vegetation would likely have been established on the sidewalls and portion of the floor of the Upper Site. During Phase 10 (Figure 15d), the entire Upper Site mining area would be visible. The majority of the Upper Site would be in vegetation although the eastern quarter and an east/west roadway would be bare ground. Figure 15e illustrates the portions of the Upper and Lower Sites blocked by topography or vegetation and not visible from this viewpoint. As perceived from the summit, the majority of the mining area on the Upper Site would be visible, and the existing view would be significantly altered. The level of visual impact from this viewpoint would be considered high.

Figures 16b and 16c illustrate the view of the proposed conveyor alignment from SE 144th Street. From this viewpoint, no views of mining areas on the Upper or Lower Sites would be available as indicated in Figure 16c. From this viewpoint (16b), a straight-on view of the conveyor alignment along the western slope of Grouse Ridge would be afforded and clearing associated with the conveyor alignment, the conveyor and portions of the maintenance road outside of the conveyor alignment would be visible following clearing during Phase 1 (Figures 16b and 16c show the view during Phase 6). Although visible, the conveyor alignment would encompass a small portion of the view and the conveyor would be enclosed in a low-reflective natural colored material to minimize visibility and glare. The level of visual impact from this viewpoint would be considered medium.

A representative view of mining activity from the Snoqualmie Point Overlook is illustrated by Figures 17b and 17c. As illustrated by Figure 17b, by Phase 6, a distant view of the eastern side wall of the Lower Site and the cleared area associated with the conveyor alignment would be afforded from this viewpoint. As indicated by Figure 17c, views to the majority of the mined area on the Lower Site, the processing facilities on the Lower Site, and the mined area on the Upper Site would be blocked by existing topography. Because of the small amount of visible mining area and distance between the sites and the viewpoint, the level of visual impact from this viewpoint would be considered low.

5.2 AREAS WITH POTENTIAL VIEWS TO THE SITES

Areas from which project elements are visible were determined by using a software program and topographic information. Field review was not conducted. The program determines whether project elements can be seen from a particular location by reviewing topography in relation to observer and project element elevations. The sum of these evaluations is depicted on the maps to show the total area from which a project element could be visible.

FIGURE 15b MAILBOX PEAK PHASE I

FIGURE 15c MAILBOX PEAK PHASE 6

FIGURE 15d MAILBOX PEAK PHASE 10

FIGURE 15e MAILBOX PEAK UNSEEN AREAS

FIGURE 16b CONVEYOR PHASE 6

FIGURE 16c CONVEYOR UNSEEN AREAS

FIGURE 17b SNOQUALMIE POINT OVERLOOK PHASE 6

FIGURE 17c SNOQUALMIE POINT OVERLOOK UNSEEN AREAS

The maps illustrate a "worst case" condition. Vegetation, which often has a substantial effect on project element visibility, is not considered. The exclusion of vegetation is particularly important to consider in evaluating the actual visibility of elements such as the conveyor that would be largely screened by existing and proposed vegetation. The maps showing areas from which project areas are visible must be considered in conjunction with the photosimulations that depict views from selected viewpoints with vegetation in place.

Figures 18, 19 and 20 illustrate the areas that have the potential for views to mining or processing activities on the Upper Site, Lower Site and conveyor alignment, respectively. As indicated in Figure 18, direct views to mining activities on the Upper Site would primarily be afforded from higher elevation areas including Mailbox Peak, Mt. Si, Rattlesnake Ridge, Mt. Washington and other higher elevation area. Views of the lowering of the northern rim of Grouse Ridge are also afforded from Lake Dorothy Road. Analysis of visual impacts from mining activity on the Upper Site is illustrated by viewpoints 1, 2, 3, 14 and 15.

As indicated in Figure 19, the potential for views to the Lower Site is less than that for the Upper Site because the elevation of the Lower Site allows for screening by topography and vegetation. Views to the Lower Site would primarily be afforded from areas to the immediate north and south and from higher elevation areas including Mount Si, Rattlesnake Ridge and Mailbox Peak. Analysis of visual impacts from mining activity on the Lower Site is illustrated by viewpoints 1, 2, 4, 8, 10, 12 and 14.

Figure 20 illustrates the areas that have the potential for direct views of the conveyor and associated roadway traversing the western slope of Grouse Ridge. As indicated by Figure 20, views to the conveyor alignment are available from many areas. However, the available views of the conveyor alignment would primarily appear as a break in the tree-line along the western slope of Grouse Ridge. Views of the break in the tree-line are reflected in viewpoints 1, 6 and 11. Direct views of the conveyor and associated roadway are limited to a small segment of SE 144th Street. Analysis of direct visual impacts from the conveyor is illustrated by viewpoint 16.

5.3 CROSS-SECTION REPRESENTATIONS

Cross-sectional representations illustrating the line-of-sight between selected viewpoints and proposed mining activity is provided in Figures 21, 22, 23, 24 and 25. Plans showing the section locations are also provided. Figure 21 illustrates the line-of-sight view from Lake Dorothy Road and higher elevation areas further to the north across the Snoqualmie River. As illustrated by Figure 21, views of the lowering of the northern rim of Grouse Ridge would be afforded from Lake Dorothy Road, although views of the northern rim would be partially screened by existing vegetation on the slope. No direct views to mining areas on the Upper Site would be afforded from Lake Dorothy Road. Some distant views to the southern side wall may be afforded from higher elevation areas (above elevation 1560) further to the north.

Figures 22 and 24 illustrate the view potential from westbound I-90. As illustrated in Figures 22 and 24, the majority of the Lower Site mining area would be hidden by existing vegetation along the north side of I-90. From the section of I-90 immediately south of the Lower Site, quick glimpses of the northern side wall would be afforded. To completely screen views to mining activity on the Lower Site from westbound I-90, vegetation at a height of 40 to 50 feet would be required on the southern berm.

FIGURE 18 SEEN AREAS UPPER SITE

FIGURE 19 SEEN AREAS LOWER SITE

FIGURE 20 SEEN AREAS CONVEYOR

FIGURE 21 SECTION N-S

FIGURE 22 SECTION A-A

FIGURE 23 SECTION B-B

FIGURE 24 SECTION C-C

FIGURE 25 SECTION D-D

Figure 23 illustrates the line-of-sight view potential from the Hahn and Lu Residences to the north of the Lower Site. As illustrated by Figure 23, views to a portion of the mining activity and processing facilities on the Lower Site are possible from the Hahn and Lu residences. To completely screen views to the mining activity on the Lower Site from the residences to the north, vegetation at a height of approximately 30 feet would be required along the northern boundary of the Lower Site.

Figure 25 illustrates the line-of-sight view potential from eastbound I-90. Because the westbound lanes are higher than the eastbound lanes, views to the Lower Site are completely blocked by the westbound lanes.

5.4 SCREENING EFFECTIVENESS OF VEGETATION

Visual simulations approximating the screening effect of vegetation at various stages of growth from the Lu Residence 1, 2 and 3 are illustrated in Figures 26, 27 and 28, respectively. Figure 26a illustrates the screening effect of vegetation between Lu Residence 1 and Lower Site mining activities. As illustrated by Figure 26a, portions of the northern screening berm, southern sidewall, a portion of the conveyor within the Lower Site mining area, and a processing plant would be visible from Lu Residence 1 during year 1. By year 5 (Figure 26b), the screening berm and southern sidewall would appear more natural in character, a smaller portion of the processing plant would be visible and the conveyor within the Lower Site mining area would be completely screened. By year 10 (Figure 26c), the screening berm and southern sidewall would appear as natural area, only a small portion of the processing plant would be visible and the conveyor within the Lower Site mining area would continue to be completely screened.

As shown in Figure 27a, at year 1 the clearing associated with the conveyor alignment, the conveyor and portions of the maintenance road outside of the conveyor alignment would be visible from the Lu Residence 2. By year 5 (figure 27b), a portion of the cleared area would be screened by vegetation. However, some cleared area, the conveyor and the maintenance road outside of the conveyor alignment would be visible. By year 10 (Figure 27c), vegetation growth along the conveyor alignment would provide further reduction in the amount of visible cleared area. However, some cleared area, the conveyor and the maintenance road outside of the conveyor alignment would continue to be visible.

As shown in Figure 28a, the majority of the Lower Site mining area would be visible from Lu Residence 3 including the mining area floor, processing plants and the pond. Vegetation along the southern sidewall would be sparse. By year 5 (Figure 28b), the vegetation along the southern sidewall would appear more natural in character, although the mining floor, processing plants and pond would be visible. By year 10 (Figure 28c) the southern side wall would appear more natural and the vegetation along the northern sidewall and berm would be at a height sufficient to screen portions of the mining floor and pond.

FIGURE 26a LU RESIDENCE 1-YEAR 1

FIGURE 26b LU RESIDENCE 1-YEAR 5

FIGURE 26c LU RESIDENCE 1-YEAR 10

FIGURE 27a LU RESIDENCE 2-YEAR 1

FIGURE 27b LU RESIDENCE 2-YEAR 5

FIGURE 27c LU RESIDENCE 2-YEAR 10

FIGURE 28a LU RESIDENCE 3-YEAR 1

FIGURE 28b LU RESIDENCE 3-YEAR 5

FIGURE 28c LU RESIDENCE 3-YEAR 10

6.0 CUMULATIVE IMPACTS

The Homestead Valley Mine immediately south of the Upper Site, the King County Public Works gravel storage yard on SE Middle Fork Rd., and the Old Stone Quarry on North Bend Way are the only active mining operations in the immediate site vicinity. The Snoqualmie Sand and Gravel Mine, also located in the general vicinity, is approximately 5 miles to the northwest. Because the location of mining operations is largely based on suitability of a site's resources and land use designations, in conjunction with the other mining operations in the site, the Proposal would not be anticipated to increase pressure for additional mining operations in the area. In addition, the Proposal would not be anticipated to increase the potential for visual impacts from additional mining operations in the vicinity.

7.0 MITIGATION MEASURES

The following project features are proposed to minimize aesthetic impacts:

- The mining plan has been designed to minimize visual impacts to the extent practical. Measures included in the mining plan to minimize visual impacts include the following:
 - The proposed mining would be phased. Upon completion of mining within an individual phase, the mined area would be reclaimed, thus limiting the amount of mining activity during any given year;
 - A naturally vegetated buffer would be retained around the perimeter of the Lower and Upper Sites to buffer nearby residential uses from the proposed mining and processing activities;
 - Mining on the Upper Site would occur below the existing rim of Grouse Ridge to minimize views of mining; and,
 - Vegetated view screening berms would be provided along portions of the northern, eastern, and southern sides of the mining area on the Lower Site.
- The ultimate reclamation of the sites, following the conclusion of mining activities, includes the following: (1) Pre-mining site preparation, including use of onsite overburden material; (2) Slope stabilization and erosion control, including stormwater control and temporary erosion-control measures such as hydroseeding and filter fence check dams; (3) Final contouring and topsoil placement; and, (4) Revegetation with trees.
- All lighting would utilize low pressure sodium bulbs; a type of lighting that emits a low-intensity light designed to minimize impacts to surrounding properties and nighttime sky viewing.
- Lighting would utilize full cutoff luminaries to direct light onto the mining areas and away from adjacent properties.
- The proposed conveyor between the Lower and Upper Sites would be enclosed in a low-reflective natural-colored material to minimize visual and glare impacts.
- Upon completion of mining activities, the sites would be transferred to public ownership.

7.1 POTENTIAL ADDITIONAL MEASURES

To further reduce lighting levels from the proposal, the following potential mitigation measures have been identified:

- Specifications for outdoor lighting on the site should require a Color Rendering Index (CRI) of 70+, and a Correlated Color Temperature (CCT) of 2700-2900 Kelvins. These lighting specifications are consistent with the U.S. National Park Service Interim Design Guidelines for Outdoor Lighting.
- Building lighting should be located high on the asphalt and concrete plant structures and include forward throw optics to direct lighting away from the sides of the buildings and onto the ground.
- Mining area lighting should be independently mounted (not directly attached to equipment) to allow for a more downward throw of light to further limit the potential for direct light to reach off-site areas.

8.0 SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

The proposed phased mining and reclamation plans have been designed to minimize visual impacts. However, mining activity and processing facilities would represent a significant unavoidable impact from some viewpoints in the vicinity, particularly higher-elevation recreation areas (Mount Si Natural Resources Conservation Area and Mailbox Peak) under Alternatives 2, 3, and 4, and the Lu residence (Viewpoint 12) under Alternatives 2 and 3 only. In addition, clearing associated with the conveyor alignment would impact some viewpoints under Alternative 2. Visual impacts of the mining operations would exist until mining on the sites ceased and reclamation activities were completed. The Proposal could increase the level of light in an area that currently contains low light levels.

9.0 REFERENCES

Jones & Jones, 1999. Cadman Site Plan.

King County, 1998. GIS data. September.

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